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10/508,750	04/15/2005	Andrew Moore	P63624	8353
156 7590 11/25/2009 Kirschstein, Israel, Schiffmiller & Picroni, P.C. 425 FIFTH AVENUE 5TH FLOOR NEW YORK, NY 10016-2223				
EXAMINER SMITH, JOSHUA Y				
ART UNIT		PAPER NUMBER		
2477				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/508,750

Applicant(s)

MOORE, ANDREW

Examiner

JOSHUA SMITH

Art Unit

2477

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 10 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 10 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The amendment filed 07/10/2009 has been entered.

- **Claims 9, 10 and 13-16 are pending.**
- **Claims 1-8, 11 and 12 are cancelled.**
- **Claim 13 is objected to.**
- **Claims 9, 10 and 14-16 stand rejected.**

Claim Objections

1. **Claim 13** is objected to because of the following: Claim 13 states "a second effective bandwidth, E_{short} , is given by and are used to give a worst case effective bandwidth estimate E " (emphasis added by examiner), where there appears there should be a formula between "by" and "and". Examiner will treat the above excerpt to indicate **a second effective bandwidth, E_{short} , is given by**

$$E_{short} = \max_{k=1,2,\dots,T} \left\{ \frac{(\overline{R_k} + \alpha_{short} \sigma_k) k T}{k \tau - \frac{q}{C}} \right\} \text{ and are used to give a worst case effective}$$

bandwidth estimate E . Appropriate correction is required.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 16 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. **Claim 16** contains steps that are not tied to an apparatus, and the steps do not inherently require a machine.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9, 10, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux et al. (Patent No.: US 6,317,416 B1) in view of Qiu et al. ("Measurement-Based Admission Control with Aggregate Traffic Envelopes", April 2001, IEEE Press, IEEE/ACM Transactions on Networking, Vol. 9, No. 2, pages 199, 200, 202, and 203) and Davis et al. (Patent No.: US 6826157 B1), hereafter respectively referred to as Giroux, Qiu, and Davis.

In regards to Claim 9, Giroux teaches in column 3, lines 12-13, a connection admission controller computes the minimum bandwidth required for each service class (providing a communications network resource to a plurality of classes of use of a network, a different level of service being associated with each class of use).

Giroux also teaches in column 2, lines 11-24, a fair queue servicing arrangement in a multi-service class packet switched network, comprising a weighted fair queuing controller, and buffer means for receiving incoming packets in queues, characterized in that further comprises means for monitoring buffer usage for each queue, means for determining the bandwidth requirements of each class of service, and a service weights manager for dynamically modifying the weights of said weighted fair queuing controller means in response to said buffer usage and bandwidth requirements (a demand estimator for estimating a worst case effective bandwidth demand for each class, and a dynamic resource allocator for allocating to each class a proportion of a network resource, a proportion allocated being dependent on an estimated worst case effective bandwidth demand for each class, and an allocation optimizing use of an available network resource while ensuring a level of service of each class is observed).

Giroux also teaches in column 2, lines 49-52, a service weight manager that dynamically modifies weights to be used by a WFQ Scheduler (a communications network element for providing to each class a proportion of network resource allocated to it).

Giroux fails to teach a demand estimator for estimating a demand by computing two demand estimates of effective bandwidth for two different timescales, one of the

demand estimates determining a short-term burstiness within a traffic envelope, and an other of the demand estimates determining a long term variance between traffic envelopes.

Qiu teaches in the Abstract, page 199, and a goal of admission control is to support quality-of-service demands of real-time applications via resource reservation, and Qiu teaches in the second and fifth paragraphs of the Introduction, page 199, extant algorithms employ user-specific traffic parameters to estimate aggregate resource demands, but this reliance on each flow's traffic parameters can render statistical services difficult to deploy, and Qiu presents an implementation of an MBAC algorithm for multiclass networks with link sharing and a development of a new theoretical framework of aggregate traffic envelopes (a demand estimator for estimating demand).

Qiu teaches in the second and third paragraphs of section A of part II, page 200, a goal of a measurement methodology is twofold, where, first, by measuring a maximal rate envelope of an aggregate flow, capturing (computing an estimate for) a short time-scale (a timescale) burstiness (demand) of traffic, and where an envelope measures a short time-scale (a timescale) burstiness (demand) and autocorrelation structure of an aggregate flow (one of the demand estimates determining a short-term burstiness within a traffic envelope), and Qiu teaches in the second and fifth paragraphs of section A of part II, page 200, measuring a variation of an aggregate flow's rate envelope (demand) to characterize (compute estimate for) longer time scale (a second timescale) fluctuations in traffic characteristics, and where a measuring of variability of an aggregate envelope (demand) over certain time slots to characterize (compute estimate

for) a variation of an envelope (demand) itself over longer time scales (a second timescale) (a demand estimator for estimating a demand by computing two demand estimates of effective bandwidth for two different timescales, one of the demand estimates determining a short-term burstiness within a traffic envelope).

Qiu teaches in second E of part III, page 207, a temporal correlation of successive traffic envelopes to capture traffic dynamics at time scales larger than that of an envelope and measurement window, and where successive traffic envelopes are correlated (and an other of the demand estimates determining a long term variance between traffic envelopes).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Qiu with the invention of Giroux since Qiu provides an algorithm for statistical services that overcomes the problems of algorithms that require acute reliance on each flow's traffic parameters and allows easier deployment of statistical services for applications that cannot accurately estimate their traffic parameters when a flow is first established and for flows with rate variations over multiple time scales that are not adequately characterized by standard traffic models, which can be introduced into the system of Giroux to aid in guaranteeing a desired Quality of Service for a service class that is beginning to experience traffic and for a service class with rate variations over multiple time scales, improving the resource utilization efficiency in the system of Giroux.

Giroux fails to teach a greater of two demand estimates giving an estimated worst case effective bandwidth demand.

Davis teaches in column 9, lines 27-52, and in FIG. 3, data pump unit 64 (FIG. 3) further includes a control logic unit, which comprises a pair of comparators 84 and 86 (FIG. 3) arranged in parallel and coupled to the filter/averaging units 78 and 82 (FIG. 3), respectively, and an "OR" logic unit 88 (FIG. 3), the outputs of the comparators 84 and 86 are provided as inputs to the "OR" logic unit 88, which generates a data rate slowdown request signal in accordance with the present invention, more specifically, the comparator 84 receives both the slow-filtered sampling interval error count from the filter/averaging unit 78 and a long-term error threshold 92 (FIG. 3) as inputs and generates a long-term error comparison signal at its output that indicates whether the slow-filtered sampling interval error count exceeds the long-term error threshold 92, and similarly, the comparator 86 receives both the fast-filtered sampling interval error count from the filter/averaging unit 82 (FIG. 3) and a short-term error threshold 94 (FIG. 3) as inputs and generates a short-term error comparison signal at its output that indicates whether the fast-filtered sampling interval error count exceeds the short-term error threshold 94, and if either the long-term error comparison signal or the short-term error comparison signal indicate that their corresponding error threshold (i.e., long-term error threshold 92 and short-term error threshold 94, respectively) has been exceeded, then the "OR" logic unit 88 generates the data rate slowdown request signal, which may be used to initiate a data rate renegotiation (a greater of two demand estimates giving an estimated worst case effective bandwidth demand).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Davis with the teachings of Giroux in view of Qiu

since Davis provides a method for improved data rate control mechanisms and related methods that may overcome the deficiencies in the prior art, and to improve the responsiveness of a communication device to errors, such as communication protocol errors, and may be used to generate a data rate slowdown request signal in response to both large error bursts and lower levels of errors that are sustained over an extended time period with reduced sensitivity to the distribution of the errors with respect to error sampling intervals (see Davis, column 5, lines 5-14, and column 6, lines 26-32), and involves monitoring each of long-term and short-term activities of data flows, which can be introduced into the teachings of Giroux in view of Qiu to ensure that if effects of either long-term and short-term activities of data flows, appropriate action may be taken to ensure errors resulting from too high data rates are reduced.

In regards to Claim 10, Giroux teaches in column 1, line 62 to column 2, line 3, a method of fair queue servicing at a queuing point in a multi-service class packet switched network, wherein incoming packets are received in buffers and outgoing packets are scheduled by a weighted fair queue scheduler characterized in that real-time information of buffer usage along with the minimum bandwidth requirement is used to dynamically modify the weights of the weighted fair queue scheduler (a network resources comprises bandwidth of a communications channel fed by a network element).

In regards to Claim 14, Giroux teaches in column 3, lines 30-33, an Internet-like best effort service that compensates for low unitization of other service classes (a best-effort service is provided as a class).

In regards to Claim 15, as discussed in the rejection of Claim 1, Giroux teaches network data traffic.

Giroux teaches in column 1, lines 28-29, CBR service is the only service that guarantees a bound on delay, and it is used for time sensitive data, such as voice and video (voice or video is transferred across a network).

In regards to Claim 16, Giroux teaches in column 3, lines 12-13, a connection admission controller computes the minimum bandwidth required for each service class

(providing a communications network resource to a plurality of classes of use of a network, a different level of service being associated with each class of use).

Giroux also teaches in column 2, lines 11-24, a fair queue servicing arrangement in a multi-service class packet switched network, comprising a weighted fair queuing controller, and buffer means for receiving incoming packets in queues, characterized in that further comprises means for monitoring buffer usage for each queue, means for determining the bandwidth requirements of each class of service, and a service weights manager for dynamically modifying the weights of said weighted fair queuing controller means in response to said buffer usage and bandwidth requirements (estimating a demand for each class, allocating to each class a proportion of a network resource, a proportion allocated being dependent on an estimated worst case effective bandwidth demand for each class, and an allocation optimizing use of an available network resource while ensuring a level of service of each class is observed).

Giroux also teaches in column 2, lines 49-52, a service weight manager that dynamically modifies weights to be used by a WFQ Scheduler (providing to each class a proportion of network resource allocated to it).

Giroux fails to teach estimating a demand by computing two demand estimates of effective bandwidth for two different timescales, one of the demand estimates determining a short-term burstiness within a traffic envelope, and an other of the demand estimates determining a long term variance between traffic envelopes.

Qiu teaches in the Abstract, page 199, and a goal of admission control is to support quality-of-service demands of real-time applications via resource reservation,

and Qiu teaches in the second and fifth paragraphs of the Introduction, page 199, extant algorithms employ user-specific traffic parameters to estimate aggregate resource demands, but this reliance on each flow's traffic parameters can render statistical services difficult to deploy, and Qiu presents an implementation of an MBAC algorithm for multiclass networks with link sharing and a development of a new theoretical framework of aggregate traffic envelopes (estimating a demand).

Qiu teaches in the second and third paragraphs of section A of part II, page 200, a goal of a measurement methodology is twofold, where, first, by measuring a maximal rate envelope of an aggregate flow, capturing (computing an estimate for) a short time-scale (a timescale) burstiness (demand) of traffic, and where an envelope measures a short time-scale (a timescale) burstiness (demand) and autocorrelation structure of an aggregate flow (one of the demand estimates determining a short-term burstiness within a traffic envelope), and Qiu teaches in the second and fifth paragraphs of section A of part II, page 200, measuring a variation of an aggregate flow's rate envelope (demand) to characterize (compute estimate for) longer time scale (a second timescale) fluctuations in traffic characteristics, and where a measuring of variability of an aggregate envelope (demand) over certain time slots to characterize (compute estimate for) a variation of an envelope (demand) itself over longer time scales (a second timescale) (a demand estimator for estimating a demand by computing two demand estimates for two different timescales).

Qiu teaches in second E of part III, page 207, a temporal correlation of successive traffic envelopes to capture traffic dynamics at time scales larger than that of

an envelope and measurement window, and where successive traffic envelopes are correlated (and an other of the demand estimates determining a long term variance between traffic envelopes).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Qiu with the invention of Giroux since Qiu provides an algorithm for statistical services that overcomes the problems of algorithms that require acute reliance on each flow's traffic parameters and allows easier deployment of statistical services for applications that cannot accurately estimate their traffic parameters when a flow is first established and for flows with rate variations over multiple time scales that are not adequately characterized by standard traffic models, which can be introduced into the system of Giroux to aid in guaranteeing a desired Quality of Service for a service class that is beginning to experience traffic and for a service class with rate variations over multiple time scales, improving the resource utilization efficiency in the system of Giroux.

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comparator 84 receives both the slow-filtered sampling interval error count from the filter/averaging unit 78 and a long-term error threshold 92 (FIG. 3) as inputs and generates a long-term error comparison signal at its output that indicates whether the slow-filtered sampling interval error count exceeds the long-term error threshold 92, and similarly, the comparator 86 receives both the fast-filtered sampling interval error count from the filter/averaging unit 82 (FIG. 3) and a short-term error threshold 94 (FIG. 3) as inputs and generates a short-term error comparison signal at its output that indicates whether the fast-filtered sampling interval error count exceeds the short-term error threshold 94, and if either the long-term error comparison signal or the short-term error comparison signal indicate that their corresponding error threshold (i.e., long-term error threshold 92 and short-term error threshold 94, respectively) has been exceeded, then the "OR" logic unit 88 generates the data rate slowdown request signal, which may be used to initiate a data rate renegotiation (a greater of two demand estimates giving an estimated worst case effective bandwidth demand).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Davis with the teachings of Giroux in view of Qiu since Davis provides a method for improved data rate control mechanisms and related methods that may overcome the deficiencies in the prior art, and to improve the responsiveness of a communication device to errors, such as communication protocol errors, and may be used to generate a data rate slowdown request signal in response to both large error bursts and lower levels of errors that are sustained over an extended time period with reduced sensitivity to the distribution of the errors with respect to error

sampling intervals (see Davis, column 5, lines 5-14, and column 6, lines 26-32), and involves monitoring each of long-term and short-term activities of data flows, which can be introduced into the teachings of Giroux in view of Qiu to ensure that if effects of either long-term and short-term activities of data flows, appropriate action may be taken to ensure errors resulting from too high data rates are reduced.

Allowable Subject Matter

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

I. Arguments for Claim Rejection under 35 USC § 101

Applicant's arguments filed 07/10/2009 have been fully considered but they are not persuasive. An apparatus must be tied to at least one step in Claim 16. Examiner suggests inserting ***by a demand estimator*** after "estimating", or inserting ***by a dynamic resource allocator*** after "allocating", or inserting ***by a communications network element*** after "providing" in Claim 10 to tie at least one step to an apparatus.

II. Arguments for Claim Rejection under 35 USC § 112, second paragraph

Applicant's arguments, see 6, filed 07/10/2009, with respect to Claim Rejection under 35 USC § 112, second paragraph of Claim 10 have been fully considered and are

persuasive. The Claim Rejection under 35 USC § 112, second paragraph of Claim 10 has been withdrawn.

III. Arguments for Claim Rejection under 35 USC § 103

Applicant's arguments with respect to claims 9 and 16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gehi et al. (Patent Number: 6,134,216), see column 7, line 1 to column 8, line 13, and FIGS. 3 and 4.

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA SMITH whose telephone number is 571-270-1826. The examiner can normally be reached on Monday-Friday, 10:30am-7pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag Shah can be reached on 571-272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joshua Smith
/J.S./
Patent Examiner
11-22-2009

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/Gregory B Sefcheck/

Primary Examiner, Art Unit 2477

11-23-2009